HUMAN RADIATION EXPERIMENTS

RECORDS PROVENANCE FORM

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|---|---|
| REPOSITORY NAME | INEL |
| COLLECTION NAME | SYSTEM FOR NUCLEAR AUXILIARY POWER TRANSIENT (SNAPTRAN) |
| BOX NUMBER | INEL BOX NO. P-24724<br>FRC NO. 356723<br>ACCESSION NO. 70 A 1464 |
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| 6. Name and telephone number of person completing form: | 7. Organization: | 8. Date: |
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| Burton R Baldwin<br>(208) 525-0203 | Lockheed Idaho Technologies Co. | March 15, 1995 |

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PHILLIPS PETROLEUM COMPANY
Atomic Energy Division
Idaho Falls, Idaho

February 10, 1965

TAN Health Physics Progress
Report for January, 1965
CORD-13-65A



Mr. J. W. McCaslin
O F F I C E

The monthly report of TAN Health Physics Section for January, 1965, is as follows:

SNAPTRAN RADIOLOGICAL REPORT

IDO-17038, Radiological Aspects of the SNAPTRAN 2/10A-3 Destructive Test, was published and released to personnel on the internal distribution list. The release of the report to external distribution is pending the evaluation of a patent review by Chicago Patent Office.

PM-2A

A. Radiation dose rate measurements of 1020 r/hr were measured inside the PM-2A reactor vessel at the mid plane using Victoreen r meter readings.

B. The PM-2A core fixture was removed from the Hot Shop to the SES well. Radiation levels in the access corridor next to the well are 600 mr/hr. Radiation warning signs have been installed at both ends of the corridor.

C. Other PM-2A jobs requiring HP coverage include continuation of the dome measurements, x-rays of the dome taken in the x-ray room, flushing the tank, etc.

D. As a result of the many hand measurement requirements on the PM-2A head six form AED-328 exposure requests were completed 1-8-65. Exposures were maintained within administrative limits.

SNAPTRAN FUEL

Decladding of the SNAPTRAN 2/10A-3 fuel remains was completed in the Warm Shop with negligible contamination spread or exposure.

RML SHUTDOWN

RML cleanup continued throughout the month, with most of the maintenance work on the manipulators and other hot equipment being done in the Warm Shop. On January 8, the entire Warm Shop floor became contaminated to 300 to 12,000 cpm per smear. Following the cleanup the contamination has been contained behind HP ribbons. No airborne activity was noted during this period.

DECONTAMINATION FACILITIES

Decontamination, chem cleaning, and sandblasting work loads continue to be greater than manhours available. Because of the large amount of highly radioactive equipment being cleaned for RML, personnel exposures are limiting the time spent in decontamination.

Major items decontaminated include:

a. RML equipment (milling machine, grinder, manipulators)
b. PM-2A tools and equipment
c. 2 casks
d. 1 large Westinghouse fixture
e. 1 EBR II cask cleaned inside and out
f. RML rail grinder and air vice

PERSONNEL

Farrell Hunt, HP Technician, terminated on 1-6-65. He was replaced by F. D. Smith who transferred from ETR.

The work load of the TAN TSF HP Section is such that about an additional half man is needed in both the decon room and in the HP section. The addition of one man to work in both sections would alleviate our shortage.

MONITORING TRUCKS

Experience with the monitoring equipment in the two mobile vehicles has shown these systems are not reliable for continuous field monitoring. Investigation is being made into the possibility of renovating this equipment so reliable use of it can be made during the SNAP and LOFT tests. Instrument Development is investigating the possibility of installing a solid state systems.

GRID SAMPLE COUNTER

An existing Tracerlab counting system has been reactivated and connected to a 3 x 3 NaI crystal to give a highly sensitive detecting system for checking grid samples for radioactivity before they are analyzed. The function of this instrument will be to ascertain which samples do not have activity on them.

FISSION GAS DETECTORS

The fission gas samplers are being modified so a larger sample of the radioactive cloud can be obtained. Gases from a high volume air sampler will be sent through a one way valve into a balloon. Low volume samplers used during the water immersion test in many cases failed to pull a large enough sample for accurate counting.

PARTICLE SIZING

a. A dust view microprojector has been renovated with a microscope borrowed from the Hot Cell Branch. This system projects the microscope image on a glass screen where it can be observed by several persons at the same time. Several areas of particle sizing have been initiated with this instrument.

b. In order to determine the magnitude of the expected cleanup following the next SNAPTRAN destructive test an investigation was conducted to determine the smallest particle of fuel that can be detected following the test. The most sensitive method devised was autoradiographs of samples. The darkened spots on the film after a 48 hour exposure could be used to detect particles as small as 70 μ. It was concluded from these tests that a clean up of the particles greater than 70 micron would be necessary. Additional tests are being conducted to reinforce these findings. More detailed procedures have been reported under separate cover (Fiel-1-65A, Fiel-2-65A and CORD-8-65A-N)

STEP

1. On January 4, 1965, a fuel element was removed from the SNAPTRAN reactor. Survey of this fuel element indicated a maximum reading of 3.7 r/hr at contact with a Juno. The reactor had not been operated for approximately twelve days which indicates that following the decay of short lived fission products the fuel elements each will read from 3 to 5 r/hr.

2. Repair of the roof on the wind damaged IET test cell building was completed and nuclear operation of the SNAPTRAN 2/10A-1 reactor was resumed on January 5, 1965.

3. The mobot ramp was installed to the SNAPTRAN 2/10A-1 reactor dolly and the Roving Manipulator System (Mobot) was successfully driven up the ramp to the elevated platform. A remotely controlled, permanently mounted electrical winch was installed at the top of the elevated platform. This cable was connected to the Mobot to insure correct alignment with the ramp and to assist the Mobot should it become necessary.

4. A detailed gamma radiation exposure survey of the shielded camera box located on top of the periscope containment enclosure on the west side of the IET test cell has been made. The camera box is located approximately 30 feet from the reactor core and consists of 4 to 6 inches of lead shielding, surrounded by two inches of borated polyethylene. Film badges have been placed both inside and outside the camera box enclosure on a number of tests to determine the effects of gamma radiation on the camera film. Results of a typical reactor excursion test produced radiation readings of 50 r outside the shielded housing and 3.5 r to 4 r inside.

Recently the polyethylene cover on the camera housing was removed and additional lead was added. On future tests film badges will be placed at various locations to determine the effectiveness of additional lead shielding.

## SPECIAL PROJECTS

A preliminary study of laser safety has been completed and a reference list compiled. A more detailed report is being prepared. At this stage it appears that the laser beam presents much the same type of problems encountered with other radiation with the exception that more control must be placed on the source since GM meters and the like are not available for detection.

The unknown source of I-128 previously found on hi-volume air sample filters taken near the SNAP reactor has been found to be due to activation of stable iodine present on the charcoal filter itself. The charcoal filters used for sampling are those sold for breathing apparatus. Since impregnation with iodine greatly increase charcoal capacity to trap mercury vapor and hydrogen sulphide gas it is assumed that this is the reason for the iodine. This is one more item that must be considered around bare reactors.

## SUMMARY OF ROUTINE WORK

| | |
|---|---|
| Smears | 2400 |
| Direct reading dosimeters issued | 10 |
| Body fluid samples | |
| Routine | 84 |
| Special | 0 |
| Liquid samples | |
| Waste water | 3 |
| Radioactive shipments | |
| Off-site | 1 |
| On-site | 24 |
| Burial ground | 4 |
| Laundry | 7 |
| Safe work permits | 78 |
| Beryllium analysis | 0 |
| Safety Meetings | 2 |
| Excess exposure requests | 6 |
| Whole body analyses | 5 |
| Green Tags | 173 |

## MAN HOUR TABULATION

### Decontamination Manhour Tabulation

| | | | |
|---|---|---|---|
| Regular assigned hours | 352 | Time charged to work request listed | 303½ |
| Borrowed help | 10½ | Time charged to clothing issue, respirator cleaning, etc. | 49 |
| Overtime | 38 | Holiday | 16 |
| | 400½ | UAB | 24 |
| | | Vacation | 8 |
| | | | 400½ |

| EXEMPT | NONEXEMPT | TOTAL | EXEMPT | NONEXEMPT | TOTAL |
|---|---|---|---|---|---|
| | Scheduled Hours | | | Actual Hours Worked | |
| 840 | 1320 | 2160 | 781 | 1336 | 2117 |
| | Overtime | | | Absences | |
| 0 | 112 | 112 | S - 15 | 24 | 39 |
| | | | SF - 4 | 8 | 12 |
| | | | H - 40 | 56 | 96 |
| | | | V - | 8 | 8 |
| | Total | 2272 | | Total | 2272 |

OLCordes:dc

cc: J. P. Lyon
M. H. Bartz
R. G. Anderson
F. L. Bentzen
J. R. Fielding
O. M. Hauge
R. E. Hayden
R. K. Ingram
R. B. Johns
B. D. Johnson
B. C. Laney
D. R. Mousseau
R. S. Peterson
D. G. Reid
A. L. Smith
J. F. Sommers
L. P. Terch
T. R. Wilson
TAN Health Physicists
O. L. Cordes
File